CLAIMS

1. DNA sequence comprising at least one coding region consisting of:

- the nucleotide sequence represented by SEQ ID NO:1 transcribing an mRNA, this mRNA encoding the TOCB (Terminal Oxidase associated with Carotenoid Biosynthesis) enzyme described by SEQ ID NO:2,

- the modified nucleotide sequence of the sequence SEQ ID NO:1, as described above, particularly by mutation and/or addition and/or deletion and/or substitution of one or more nucleotide(s), this modified sequence transcribing an mRNA which itself encodes the TOCB described by SEQ ID NO:2, or encoding a modified protein of said TOCB, said modified protein having enzymatic activity which is equivalent to that of the TOCB represented by SEQ ID NO:2.

2. DNA sequence comprising at least one coding region consisting of:

- the complementary nucleotide sequence represented by SEQ ID NO:1, this sequence transcribing an antisense mRNA capable of hybridizing with the mRNA encoded by the sequence SEQ ID NO:1,

- the modified nucleotide sequence of the sequence described above, by mutation and/or addition and/or deletion and/or substitution of one or more nucleotide(s), this modified sequence transcribing an antisense mRNA capable of hybridizing with an mRNA mentioned above,

- a fragment of one of the nucleotide sequences mentioned above, said fragment transcribing an antisense mRNA capable of pairing with the mRNA encoded by the complementary sequence of SEQ ID NO:1.

3. mRNA transcribed from the DNA sequence according to Claim 1, and more particularly transcribed from the complementary DNA sequence represented by SEQ ID NO:1, said mRNA encoding the TOCB enzyme described by SEQ ID NO:2, or a fragment or a modified protein of the enzyme, and having activity which is

equivalent to that of said enzyme in the plant.

4. Antisense mRNA transcribed from the complementary DNA sequence according to Claim 2, comprising nucleotides which are complementary to all or a portion of the nucleotides constituting the native mRNA, and which are capable of hybridizing with said mRNA.

5. Protein with the activity of the native TOCB enzyme described by SEQ ID NO:2, or any modified protein of said TOCB enzyme, particularly by addition and/or deletion and/or substitution of one or more amino acids, or any fragment derived from the TOCB enzyme or from a modified sequence of the enzyme, said modified protein or fragment having enzymatic activity which is equivalent to that of the TOCB enzyme.

6. Complex formed between an antisense mRNA according to Claim 4 and an mRNA encoding a TOCB enzyme in the plant.

7. Recombinant DNA, characterized in that it comprises a DNA sequence according to Claim 1, said sequence being inserted into a heterologous sequence, said sequences transcribing all or a portion of an mRNA sequence encoding all or a portion of the TOCB enzyme, said enzyme having enzymatic activity equivalent to that of the TOCB enzyme of the plant.

8. Recombinant DNA, characterized in that it comprises all or a portion of a DNA sequence according to Claim 2, said sequence being inserted into a heterologous sequence, said sequences transcribing all or a portion of an antisense mRNA sequence capable of pairing with an mRNA encoding a TOCB enzyme in the plant.

9. Recombinant DNA according to Claim 7 or 8, characterized in that it comprises the elements required to control the expression of the inserted nucleotide sequence, particularly a promoter sequence and a transcription termination sequence.

10. Vector for transforming plants, which is

Sub A1 >

add A4 >

adapted to increase carotenoid biosynthesis, comprising all or a portion of the nucleotide sequence SEQ ID NO:1 according to Claim 1, encoding all or a portion of an enzyme involved in carotenoid synthesis, represented by SEQ ID NO:2, preceded by an origin of replication of the transcription of the plants, such that the vector can generate mRNA in the plant cells.

11. Vector for transforming plants, which is adapted to reduce or stop carotenoid biosynthesis, comprising all or a portion of the strand of the nucleotide sequence which is complementary to SEQ ID NO:1 according to Claim 2, preceded by an origin of replication of the transcription of the plants, such that the complementary strand transcribed can pair with the mRNA encoding the plant's TOCB enzyme involved in carotenoid synthesis.

12. Plant cell transformed with a vector according to Claim 10 or 11.

13. Plant, or plant fragment, particularly a fruit, seed, petal or leaf, comprising cells according to Claim 12.

14. Process for modifying the production of carotenoids in a plant, either by increasing the production of carotenoids, or by reducing or inhibiting the production of carotenoids by the plant, relative to the normal content of carotenoids produced by the plant, said process comprising the transformation of cells of said plants to be transformed with a vector according to Claim 10 or 11.

15. Process for producing carotenoids in a plant cell, or eukaryotic or prokaryotic cell, said process comprising the transformation of cells of said plants, eukaryotic or prokaryotic cells to be transformed with a vector according to Claim 10.

16. Process for selecting compounds of herbicidal nature, in which said agent is placed in contact with cells or cell membranes, of Claim 12, and a reduction in the consumption of oxygen by the membranes of said

cells, which is associated with the inhibition of the terminal oxidase associated with carotenoid biosynthesis, is observed.